

IN THE CLAIMS:

Claims 1-20 (cancelled without prejudice)

21. (new) A volume adjustable pipette (10;10';10") comprising a housing (12), a plunger (20) mounted for axial movement in the housing to and from a stop (32s;32s';32s') during aspiration of a fluid into and dispensing of the fluid from a tip extending from the housing, an axially moveable volume setting member (32;32';32") in the housing defining the stop (32s; 32s'; 32s') for the plunger and a volume setting for the pipette, a turnable volume adjusting member (33;33';33') and volume adjusting means (22;22';22") for axially moving the volume setting member (32;32';32") in response to a turning of the volume adjusting member (33;33';33'), characterized by:

coarse volume setting means (34;34';34") in the volume adjusting means (22;22';22") responsive to a turning of the volume adjusting member (33;33';33') for axially moving the volume setting member (32;32';32") relatively large axial distances in response to relatively small turnings of the volume adjusting member (33;33';33');

fine volume setting means (35;35';35") in the volume adjusting means (22;22';22") responsive to a turning of the volume adjusting member (33;33';33') for axially moving the volume setting member (32;32';32") relatively small axial distances in response to relatively large turnings of the volume adjusting member (33;33';33');

one of the coarse and fine volume setting means (34,34';35,35';35") defining a one of the volume setting means

and the other of the coarse and fine volume setting means defining an other of the volume setting means, the one of the volume setting means being characterized by a force threshold (58;87;96) for axial movement of the volume setting member (32;32';32'') by the one of the volume setting means that is exceeded by a predetermined movement of the other of the volume setting means in response to a turning of the volume adjusting member (33;33';33'); and

means (60,61;60',61,61';60'',61'') for overcoming the force threshold (58;87;96) in response to a turning of the volume adjusting member (33;33';33').

22. (new) The pipette (10;10') of claim 21 further including means (16,75) for monitoring the position of the plunger (20) within the housing (12).

23. (new) The pipette (10;10') of claim 21 further including means (16,75,42) for monitoring the position of the volume setting member (32) within the housing (12).

24. (new) The pipette (10) of claim 21 wherein:

the coarse volume setting means (34) includes a relatively coarse thread (53t) on an axially extending screw (52) carried by the volume setting member (32); and

the fine volume setting means (35) comprises a relatively fine thread (51t) on the screw (52) and a relatively fine thread (49t) on a sleeve (44) comprising the volume adjusting member

(33) and which engages the relatively fine thread (51t) on the screw (52).

25. (new) The pipette (10) of claim 24 further comprising:  
a fine adjustment limiter (60) on a one of the volume adjusting member (33) or screw (52); and

a shoulder (61) on another of the volume adjusting member (33) or screw (52) for engaging the limiter whereby a turning of the volume adjusting member (33) with the limiter against the shoulder produces a turning of the screw (52) with the volume adjusting member (33).

26. (new) The pipette (10';10") of claim 21 further comprising:

a gear mechanism (22';22") between the volume adjusting member (33'; 33') and the volume setting member (32';32") and responsive to a turning of the volume adjusting member (33';33') to selectively produce a relatively small axial movement of the volume setting member through the fine volume setting means (35';35") and responsive to a turning of the volume adjusting member (33';31') to produce a relatively large axial movement of the volume setting member (32';32") through the coarse volume setting means (34';34").

27. (new) The pipette (10') of claim 26 wherein:

the volume setting member (32') comprises an axially extending screw (52') having a relatively coarse thread (53t);  
and

the gear mechanism (22') comprises a planetary gear mechanism including

a planetary gear carrier (82) on the screw (52') comprising the volume setting member (32'),

a plurality of circumferentially spaced planetary gears (83) on the carrier separately mating with an outer ring gear (84) and

an inner sun gear (81) carried by the volume adjusting member (33') mating with the plurality of planetary gears (83) to produce a turning of the sun gear, planetary gears and volume setting member (32') in response to a turning of the volume adjusting member (33') to adjust the volume setting of the pipette.

28. (new) The pipette (10') of claim 27 wherein one of the coarse (34') or fine (35') volume setting means is characterized by a force threshold for movement of the volume setting member (32') by the one of the coarse (34') or fine (35') volume setting means which is exceeded by a predetermined movement of the other of the coarse or fine volume setting means by the volume adjusting member (33').

29. (new) The pipette (10') of claim 28 further comprising:

a gear housing (85);

a fine adjustment limiter (60') on a one of the volume adjusting member (33') or a gear housing (85); and

a shoulder (61) on another of the volume adjusting member (33') or gear housing (85) for engaging the limiter whereby a turning of the volume adjustment member (33') with the limiter against the shoulder produces a turning of the ring gear (84) with the planetary gears (83) and carrier (82) to turn the volume setting member (32') thereby adjusting the volume setting for the pipette.

30. (new) The pipette (10') of claim 29 further comprising a counter wheel (90) for turning with the volume setting member (32') to indicate the volume setting of the pipette.

31. (new) The pipette (10") of claim 26 wherein:

the coarse volume setting means (34") includes a thread (53t") on an axially extending screw (52") comprising the volume setting member (32"); and

the gear mechanism (22') comprises a planetary gear mechanism including

a planetary gear carrier (82') on the screw (52"),

a plurality of circumferentially spaced planetary gears (83') on the carrier (82') separately mating with an outer ring gear (84') coupled to the carrier and

an inner sun gear (81') carried by the volume setting member (32") mating with the plurality of planetary gears (83') to produce a turning of the sun gear, planetary gears and volume

setting member in response to a turning of the volume adjusting member (33') to adjust the volume setting of the pipette.

32. (new) The pipette (10") of claim 31 further comprising:

a gear housing (85'):

a fine adjustment limiter (60") on one of the housing (85') or ring gear (84'); and

a shoulder (61") on another of the housing (85') or ring gear (84') for engaging the limiter (60") whereby a turning of the volume adjustment member (33') with the limiter against the shoulder produces a turning of the ring gear (84') with the planetary gears (83') and carrier (82') to turn the volume setting member (32") thereby adjusting the volume setting for the pipette.

33. The pipette (10") of claim 32 further comprising counter wheel means (100,102,104) for turning with the volume setting member (32") to indicate the volume setting of the pipette.